CANCER RESEARCH

A Monthly Journal of Articles and Abstracts Reporting Cancer Research

VOLUME FIVE

THE OFFICIAL ORGAN

of the

AMERICAN ASSOCIATION FOR CANCER RESEARCH, INC.

PHILADELPHIA

THE INTERNATIONAL CANCER RESEARCH FOUNDATION

1945

CANCER RESEARCH

This journal is sponsored by the American Association for Cancer Research, Inc., The Anna Fuller Fund, The International Cancer Research Foundation, and The Jane Coffin Childs Memorial Fund for Medical Research.

Advisory Board

MILDRED W. S. SCHRAM, *Chairman*

S. BAYNE-JONES — JAMES B. MURPHY

C. C. LITTLE — GEORGE M. SMITH

Editorial Committee

JAMES B. MURPHY, *Chairman* — WM. H. WOGLOM, *Editor*

CLARA J. LYNCH, *Editor, Abstracts Section*

JOHN J. BITTNER
ALEXANDER BRUNSCHWIG
E. V. COWDRY
LOUIS I. DUBLIN
GIOACCHINO FAILLA
LOUIS F. FIESER
JACOB FURTH
WILLIAM U. GARDNER
JESSE P. GREENSTEIN
FRANCES L. HAVEN
BALDUIN LUCKÉ
E. C. MACDOWELL
G. BURROUGHS MIDER
EDGAR G. MILLER, JR.
JOHN J. MORTON
EDITH H. QUIMBY
MURRAY J. SHEAR
HAROLD L. STEWART
GRAY H. TWOMBLY
SHIELDS WARREN

Abstractors

CARLETON AUGER
W. A. BARNES
S. BAYNE-JONES
M. BELKIN
E. BOYLAND
J. B. BRIGGS
R. BRIGGS
W. J. BURDETTE
A. CLAUDE
A. CORNELL
H. G. CRABTREE
H. J. CREECH
Z. DISCHE
C. E. DUNLAP
T. B. DUNN
M. DURAN-REYNALS
W. E. GYE
A. HADDOW
J. B. HAMILTON
F. L. HAVEN
I. HIEGER
G. H. HOGEBOOM
M. E. HOWARD
R. A. HUSEBY
R. N. JONES
E. L. KENNAWAY
J. G. KIDD
A. KIRSCHBAUM
E. A. LAWRENCE
M. L. LEVIN
R. J. LUDFORD
V. F. MARSHALL
W. V. MAYNEORD
J. L. MELNICK
M. H. PESKIN
C. A. PFEIFFER
K. R. PORTER
L. W. PRICE
E. H. QUIMBY
E. C. RICHARDSON
D. SHEMIN
R. E. SNYDER
E. E. SPROUL
K. G. STERN
C. WARREN
F. L. WARREN
H. Q. WOODARD
G. W. WOOLLEY

Published by The International Cancer Research Foundation.

Publication Office, 1500 Greenmount Ave., Baltimore 2, Maryland.

The annual subscription rates for one volume are: To members of the American Association for Cancer Research, Inc., $5.00; to others and to libraries, institutions, and organizations, $7.00. Business communications, remittances, and subscriptions should be addressed to Robert W. Briggs, Business Manager, 1500 Greenmount Ave., Baltimore 2, Md., or 1916 Lincoln-Liberty Building, Philadelphia 7, Pa.

No responsibility is accepted by the Committee, by the Board, or by the Publishers of *Cancer Research* for opinions expressed by contributors.

Entered as second class matter February 12, 1941, at the Post Office at Baltimore, Md., under the Act of March 3, 1879.

Copyright, 1945, by The International Cancer Research Foundation.

SEE INSIDE BACK COVER FOR INFORMATION FOR CONTRIBUTORS

(5)

Contents of Volume 5

JANUARY, 1945. NUMBER 1

W. L. Simpson, C. Carruthers, and W. Cramer. Loss of Carcinogenic Activity when Methylcholanthrene is Dissolved in Anhydrous Lanolin 1

W. L. Simpson, and W. Cramer. Sensitization of Skin by Carcinogenically Inactive Methylcholanthrene to Subsequent Carcinogenesis 5

F. Duran-Reynals, E. W. Shrigley, and E. de Hostos. Carcinogenesis Induced by Methylcholanthrene in Pigeons, Guinea Fowls, and Ducks 11

Van R. Potter, and Gertrude J. Liebl. Biocatalysts in Cancer Tissue. V. Adenosinetriphosphatase 18

Van R. Potter, W. C. Schneider, and Gertrude J. Liebl. Enzyme Changes During Growth and Differentiation in the Tissues of the Newborn Rat 21

F. Duran-Reynals. Immunological Factors that Influence the Neoplastic Effects of the Rabbit Fibroma Virus 25

Robert A. Huseby, Zelda B. Ball, and Maurice B. Visscher. Further Observations on the Influence of Simple Caloric Restriction on Mammary Cancer Incidence and Related Phenomena in C3H Mice 40

Edward W. Wallace, Helene Wallace, and C. A. Mills. Influence of Environmental Temperature upon the Incidence and Course of Spontaneous Tumors in Spayed C3H Mice 47

F. L. Warren. Estimation of Urinary 17-Ketosteroids in the Diagnosis of Adrenal Cortical Tumors 49

The American Association for Cancer Research, Inc. Special Meeting of the Board of Directors, October 12, 1944 55

Abstracts 56-61

Experimental Research, Animal Tumors 56-59

Clinical and Pathological Reports 59-61

Book Reviews 62-64

FEBRUARY, 1945. NUMBER 2

E. C. MacDowell, J. S. Potter, and M. J. Taylor. Mouse Leukemia. XII. The Role of Genes in Spontaneous Cases 65

E. W. Miller, and F. C. Pybus. The Inheritance of Cancer in Mice. With Special Reference to Mammary Carcinoma 84

E. W. Miller, and F. C. Pybus. The Effect of Foster Nursing on the Incidence of Spontaneous Mammary Carcinoma in Two Inbred Strains of Mice 94

M. C. Reinhard, H. L. Goltz, and S. G. Warner. Further Studies on the Quantitative Determination of the Growth of a Transplantable Mouse Adenocarcinoma 102

Michael Levine. The Effect of Colchicine and X-Rays on Onion Root Tips 107

Abstracts 120-128

Experimental Research, Animal Tumors 120-127

Clinical and Pathological Reports 127-128

MARCH, 1945. NUMBER 3

A. H. M. Kirby. Attempts to Induce Stomach Tumors. IV. The Effects of (a) Cholesteryl Esters Heated to 300° C., and (b) Cholesterol Heated to 430° C 129

S. Beck, A. H. M. Kirby, and P. R. Peacock. Tumors Induced with Heated Cholesterol 135

William O. Russell. The Response of the Central Nervous System of the Rat to Methylcholanthrene. I. The Induction of Tumors Derived from Nervous Tissue 140

William O. Russell. The Response of the Central Nervous System of the Rat to Methylcholanthrene. II. The Effect of a Diet Deficient in Thiamine and Riboflavin on the Induction of Tumors Derived from Nervous Tissue 152

J. A. Miller, and C. A. Baumann. The Determination of *p*-Dimethylaminoazobenzene, *p*-Monomethylaminoazobenzene, and *p*-Aminoazobenzene in Tissue 157

J. A. Miller, E. C. Miller, and C. A. Baumann. On the Methylation and Demethylation of Certain Carcinogenic Azo Dyes in the Rat 162

Robert E. Stowell. The Effects of Roentgen Radiation on the Thymonucleic Acid Content of Transplantable Mammary Carcinomas 169
John J. Biesele. Chromosomal Enlargement in Neoplastic Rabbit Tissues 179
Abstracts 183-192
Experimental Research, Animal Tumors 183-188
Clinical and Pathological Reports 189-192

APRIL, 1945. NUMBER 4

George W. Woolley, and C. C. Little. The Incidence of Adrenal Cortical Carcinoma in Gonadectomized Female Mice of the Extreme Dilution Strain. I. Observations on the Adrenal Cortex 193
George W. Woolley, and C. C. Little. The Incidence of Adrenal Cortical Carcinoma in Gonadectomized Female Mice of the Extreme Dilution Strain. II. Observations on the Accessory Sex Organs 203
George W. Woolley, and C. C. Little. The Incidence of Adrenal Cortical Carcinoma in Gonadectomized Male Mice of the Extreme Dilution Strain 211
Elizabeth Fekete, and C. C. Little. Histological Study of Adrenal Cortical Tumors in Gonadectomized Mice of the ce Strain 220
J. A. Miller, and C. A. Baumann. The Carcinogenicity of Certain Azo Dyes Related to *p*-Dimethylaminoazobenzene 227
Kanematsu Sugiura, C. R. Halter, C. J. Kensler, and C. P. Rhoads. Observations on Rats Fed with Compounds Related to Dimethylaminoazobenzene 235
Harry Allen, L. H. Hempelmann, Jr., and Nathan A. Womack. The Effect of Insoluble Radiophosphorus (Chromium Phosphate) When Applied Interstitially in the Treatment of Adenocarcinoma of the Mamma in Mice 239
William H. Woglom. Some Synonyms for "Marked." An Editorial 247
Abstracts 248-256
Reports of Research 248-254
Clinical and Pathological Reports 254-256

MAY, 1945. NUMBER 5

R. J. Ludford, and Hilda Barlow. Sarcomatous Transformation of the Stroma of Mammary Carcinomas That Stimulated Fibroblastic Growth *in Vitro* 257
I. Berenblum. 9,10-Dimethyl-1,2-Benzanthracene as a Highly Potent Carcinogen for the Rabbit's Skin 265
Harry S. N. Greene, and Edwin D. Murphy. The Heterologous Transplantation of Mouse and Rat Tumors 269
Robert E. Stowell. Thymonucleic Acid in Tumors 283
Robert E. Stowell, and Zola K. Cooper. The Relative Thymonucleic Acid Content of Human Normal Epidermis, Hyperplastic Epidermis, and Epidermoid Carcinomas 295
Philip R. White. Respiratory Behavior of Bacteria-Free Crown-Gall Tissues 302
Abstracts 312-320
Reports of Research 312-316
Clinical and Pathological Reports 317-320

JUNE, 1945. NUMBER 6

George W. Woolley, and C. C. Little. The Incidence of Adrenal Cortical Carcinoma in Gonadectomized Female Mice of the Extreme Dilution Strain. III. Observations on Adrenal Glands and Accessory Sex Organs in Mice 13 to 24 Months of Age 321
W. C. Hueper, and Frank H. J. Figge. Porphyrin Excretion of Harderian Glands in Its Relation to Actinic Carcinogenesis in Hairless Rats 328
W. C. Hueper. The Influence of Epidermal Cornification upon Carcinogenesis in Hairless Rats 331
Janet E. Giese, J. A. Miller, and C. A. Baumann. The Carcinogenicity of *m'*Methyl-*p*-Dimethylaminoazobenzene and of *p*-Monomethylaminoazobenzene 337
R. Norman Jones, and J. Ralph Jamieson. The Recovery of Carcinogenic Hydrocarbons from Solution by the Use of Picric Acid 341

H. G. Crabtree. Influence of Unsaturated Dibasic Acids on the Induction of Skin Tumors by Chemical Carcinogens 346
C. D. Haagensen, and H. T. Randall. Milk-Induced Mammary Carcinoma in Mice 352
Edward W. Shrigley, Harry S. N. Greene, and F. Duran-Reynals. Studies on the Variation of the Rous Sarcoma Virus Following Growth of the Tumor in the Anterior Chamber of the Guinea Pig Eye 356
Kenneth G. Scott. Metabolic Studies on Leukemic Mice with the Aid of Radioactive Phosphorus 365
Wray J. Tomlinson, and Lester A. Wilson, Jr. The Incidence of Malignant Tumors in British West Indian and Panamanian Negro Autopsy Populations 368
Abstracts 372-382
Reports of Research 372-376
Clinical and Pathological Reports 376-382
Book Reviews 383-384

JULY, 1945. NUMBER 7

A. Glücksmann. The Histogenesis of Benzpyrene-Induced Epidermal Tumors in the Mouse 385
G. C. Mueller, J. A. Miller, and H. P. Rusch. The Disappearance of Carcinogenic Hydrocarbons in Autoxidizing Lipids 401
L. M. Shabad. On Tumor-Producing Chemical Substances 405
William H. Woglom. Methylcholanthrene Papillomas and the Virus Problem 420
B. Miszurski, M. Pikovski, G. Goldhaber, and L. Doljanski. Effect of X-Rays on the Transmissibility of Fowl Sarcoma in Its Nonfilterable Phase 422
Jacob Heiman. The Effect of Progesterone and Testosterone Propionate on the Incidence of Mammary Cancer in Mice 426
H. P. Rusch, B. E. Kline, and C. A. Baumann. The Influence of Caloric Restriction and of Dietary Fat on Tumor Formation with Ultraviolet Radiation 431
Abstracts 436-446
Reports of Research 436-440
Clinical and Pathological Reports 440-446
Book Reviews 447-448

AUGUST, 1945. NUMBER 8

W. L. Simpson, and W. Cramer. Fluorescence Studies of Carcinogens in Skin. II. Mouse Skin after Single and Multiple Applications of 20-Methylcholanthrene 449
L. F. Wicks, and V. Suntzeff. Changes in Epidermal Cholesterol During Methylcholanthrene Carcinogenesis in Mice 464
Rupert A. Willis. Further Studies on the Mode of Origin of Carcinomas of the Skin 469
G. C. Mueller, and H. P. Rusch. The Effect of 3,4-Benzpyrene on the Autoxidation of Unsaturated Fatty Acids 480
E. C. Dodds, W. Lawson, and P. C. Williams. Testing Carcinogen Analogues for Carcinogenic Activity 485
Abstracts 487-496
Reports of Research 487-491
Clinical and Pathological Reports 491-496

SEPTEMBER, 1945. NUMBER 9

W. U. Gardner. Some Influences of Hormones on the Growth and Persistence of Transplanted Testicular Tumors 497
George W. Woolley, and C. C. Little. The Incidence of Adrenal Cortical Carcinoma in Male Mice of the Extreme Dilution Strain over One Year of Age 506
Charles Huggins, and Peter Vincent Moulder. Estrogen Production by Sertoli Cell Tumors of the Testis 510
Alexander Lipschütz, Demetrio Yanine, Juan Schwarz, Silvio Bruzzone, Julio Acuña, and Salomón Silberman. Induction and Prevention of Fibromyoepithelioma of the Utricular Bed in Male Guinea Pigs 515
H. Burrows, Edna M. F. Roe, and B. Schober. Potential Differences in the Skin of Mice during Carcinogenesis 524

ROBERT SCHREK, and GERALD R. ALLABEN. Statistical Analysis of 2,407 Admissions to the Tumor Clinic of Veterans Hospital, Hines, Illinois, during 1943 539
NOTE TO THE EDITOR 547
ABSTRACTS 548-560
Reports of Research 548-550
Clinical and Pathological Reports 551-560

OCTOBER, 1945. NUMBER 10

I. BERENBLUM. A System of Grading Carcinogenic Potency 561
H. P. RUSCH, G. C. MUELLER, and B. E. KLINE. The Effect of the Autoxidizability of Lipoidal Solvents on Sarcogenesis by 3,4-Benzpyrene 565
V. SUNTZEFF, CHRISTOPHER CARRUTHERS, and E. V. COWDRY. Influence of Age on Calcium in Epidermal Carcinogenesis Induced by Methylcholanthrene in Mice 572
WILLIAM H. WOGLOM. Chronic Inflammation and Carcinogenesis 576
FRITZ BISCHOFF, LOUISE P. INGRAHAM, and GEORGENA J. CLARKE. Influence of Nontoxic Amounts of Estradiol upon Carcinogenesis in Intact and Castrated Male and Female Mice of the Marsh-Buffalo Strain 579
FRITZ BISCHOFF. Influence of Breeding on the Incidence and Onset of Carcinoma of the Mammary Gland in Marsh-Buffalo Mice 582
S. G. WARNER, M. C. REINHARD, and H. L. GOLTZ. The Relative Importance of the Milk Agent and Inherited Susceptibility to It in the Development of Mammary Tumors in Mice 584
PROCEEDINGS OF THE AMERICAN ASSOCIATION FOR CANCER RESEARCH, INC.
36th Annual Meeting, New York, N. Y., May 8, 1945 587-598
Proceedings of Scientific Sessions 587-594
Proceedings of Business Sessions 595-598
ABSTRACTS 599-608
Reports of Research 599-604
Clinical and Pathological Reports 605-608

NOVEMBER, 1945. NUMBER 11

ALBERT TANNENBAUM. The Dependence of Tumor Formation on the Degree of Caloric Restriction 609
ALBERT TANNENBAUM. The Dependence of Tumor Formation on the Composition of the Calorie-Restricted Diet as Well as on the Degree of Restriction 616
PHILIP P. COHEN. Glyoxalase Activity of Liver from Rats Fed *p*-Dimethylaminoazobenzene. 626
PHILIP P. COHEN, and EVA K. SOBER. Glyoxalase Activity of Erythrocytes from Cancerous Rats and Human Subjects 631
D. E. LEA. The Biological Assay of Carcinogens 633
B. E. KLINE, J. A. MILLER, and H. P. RUSCH. Certain Effects of Egg White and Biotin on the Carcinogenicity of *p*-Dimethylaminoazobenzene in Rats Fed a Sub-Protective Level of Riboflavin 641
WILHELMINA F. DUNNING, MAYNIE R. CURTIS, and MARK E. MAUN. Spontaneous Malignant Mixed Tumors of the Rat, and the Successful Transplantation and Separation of both Components from a Mammary Tumor 644
B. R. BURMESTER, and C. O. PRICKETT. The Development of Highly Malignant Tumor Strains from Naturally Occurring Avian Lymphomatosis 652
ABSTRACTS 661-669
Reports of Research 661-664
Clinical and Pathological Reports 665-669
BOOK REVIEW 670-672

DECEMBER, 1945. NUMBER 12

A. H. M. KIRBY. Studies in Carcinogenesis with Azo Compounds. I. The Action of Four Azo Dyes in Mixed and Pure Strain Mice 673
A. H. M. KIRBY. Studies in Carcinogenesis with Azo Compounds. II. The Action of Azo Compounds in Mice, and the Bearing Thereof on Theories of Azo Dye Carcinogenesis 683

FRANK L. APPERLY, and M. K. CARY. The Deterrent Effect of Light upon the Incidence of Spontaneous Mammary Cancer in Mice 697
H. P. RUSCH, R. O. JOHNSON, and B. E. KLINE. The Relationship of Caloric Intake and of Blood Sugar to Sarcogenesis in Mice 705
E. C. MILLER, C. A. BAUMANN, and H. P. RUSCH. Certain Effects of Dietary Pyridoxine and Casein on the Carcinogenicity of *p*-Dimethylaminoazobenzene 713
WALTER C. SCHNEIDER. Phosphorus Compounds in Animal Tissues. II. The Nucleic Acid Content of Homologous Normal and Cancer Tissues 717
OTTO SAPHIR, MAX APPEL, and DANIEL H. LEVINTHAL. Attempts to Localize Tumor Metastases in Long Bones by Mechanical Trauma 722
C. M. POMERAT. Reticuloendothelial Immune Serum (REIS). III. The Effect of Strong Concentrations on the Growth of Walker Rat Sarcoma 319 *in vitro* 724
ABSTRACTS 729-737
Reports of Research 729-734
Clinical and Pathological Reports 734-737
INDEX 738-768